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ENGROSSED SUBSTITUTE HOUSE BILL 1004

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State of Washington

61st Legislature

2009 Regular Session

By House Technology, Energy & Communications (originally sponsored by Representatives Morris, Chase, Morrell, Upthegrove, Hudgins, and Moeller)

READ FIRST TIME 02/05/09.

1 AN ACT Relating to adding products to the energy efficiency code;  
2 and amending RCW 19.260.030, 19.260.040, and 19.260.050.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 **Sec. 1.** RCW 19.260.030 and 2006 c 194 s 2 are each amended to read  
5 as follows:

6 (1) This chapter applies to the following types of new products  
7 sold, offered for sale, or installed in the state: (a) Automatic  
8 commercial ice cube machines; (b) ~~((commercial clothes washers; (c)~~  
9 ~~commercial prerinse spray valves; (d))~~ commercial refrigerators and  
10 freezers; ~~((e) metal halide lamp fixtures; (f) single voltage external~~  
11 ~~AC-to-DC power supplies; (g))~~ (c) state-regulated incandescent  
12 reflector lamps; ~~((and (h) unit heaters))~~ (d) wine chillers for use by  
13 an individual; (e) hot water dispensers and minitank electric water  
14 heaters; (f) bottle-type water dispensers and point-of-use water  
15 dispensers; (g) pool heaters, residential pool pumps, and portable  
16 electric spas; (h) tub spout diverters; and (i) commercial hot food  
17 holding cabinets. This chapter applies equally to products whether  
18 they are sold, offered for sale, or installed as a stand-alone product  
19 or as a component of another product.

1 (2) This chapter does not apply to (a) new products manufactured in  
 2 the state and sold outside the state, (b) new products manufactured  
 3 outside the state and sold at wholesale inside the state for final  
 4 retail sale and installation outside the state, (c) products installed  
 5 in mobile manufactured homes at the time of construction, or (d)  
 6 products designed expressly for installation and use in recreational  
 7 vehicles.

8 **Sec. 2.** RCW 19.260.040 and 2006 c 194 s 3 are each amended to read  
 9 as follows:

10 The legislature establishes the following minimum efficiency  
 11 standards for the types of new products set forth in RCW 19.260.030.

12 (1)(a) Automatic commercial ice cube machines must have daily  
 13 energy use and daily water use no greater than the applicable values in  
 14 the following table:

Equipment type	Type of cooling	Harvest rate (lbs. ice/24 hrs.)	Maximum energy use (kWh/100 lbs.)	Maximum condenser water use (gallons/100 lbs.ice)
Ice-making head	water	<500	7.80 - .0055H	200 - .022H
		>=500<1436	5.58 - .0011H	200 - .022H
		>=1436	4.0	200 - .022H
Ice-making head	air	450	10.26 - .0086H	Not applicable
		>=450	6.89 - .0011H	Not applicable
Remote condensing but not remote compressor	air	<1000	8.85 - .0038	Not applicable
		>=1000	5.10	Not applicable
Remote condensing and remote compressor	air	<934	8.85 - .0038H	Not applicable
		>=934	5.3	Not applicable
Self-contained models	water	<200	11.40 - .0190H	191 - .0315H
		>=200	7.60	191 - .0315H
Self-contained models	air	<175	18.0 - .0469H	Not applicable
		>=175	9.80	Not applicable

31 Where H= harvest rate in pounds per twenty-four hours which must be reported within 5% of the tested value.

32 "Maximum water use" applies only to water used for the condenser.

33 (b) For purposes of this section, automatic commercial ice cube  
 34 machines shall be tested in accordance with ARI 810-2003 test method as  
 35 published by the air-conditioning and refrigeration institute. Ice-

1 making heads include all automatic commercial ice cube machines that  
 2 are not split system ice makers or self-contained models as defined in  
 3 ARI 810-2003.

4 ~~(2) ((Commercial clothes washers must have a minimum modified  
 5 energy factor of 1.26. For the purposes of this section, capacity and  
 6 modified energy factor are defined and measured in accordance with the  
 7 current federal test method for clothes washers as found at 10 C.F.R.  
 8 Sec. 430.23.~~

9 ~~(3) Commercial prerinse spray valves must have a flow rate equal to  
 10 or less than 1.6 gallons per minute when measured in accordance with  
 11 the American society for testing and materials' "Standard Test Method  
 12 for Prerinse Spray Valves," ASTM F2324-03.~~

13 ~~(4))~~ (a) Commercial refrigerators and freezers must meet the  
 14 applicable requirements listed in the following table:

Equipment Type	Doors	Maximum Daily Energy Consumption (kWh)
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are refrigerators	Solid	0.10V+ 2.04
	Transparent	0.12V+ 3.34
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are "pulldown" refrigerators	Transparent	.126V+ 3.51
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are freezers	Solid	0.40V+ 1.38
	Transparent	0.75V+ 4.10
Reach-in cabinets that are refrigerator- freezers with an AV of 5.19 or higher	Solid	0.27AV - 0.71

26 kWh= kilowatt hours  
 27 V= total volume (ft<sup>3</sup>)  
 28 AV= adjusted volume=[1.63 x freezer volume (ft<sup>3</sup>)]+ refrigerator volume (ft<sup>3</sup>)

29 (b) For purposes of this section, "pulldown" designates products  
 30 designed to take a fully stocked refrigerator with beverages at 90  
 31 degrees F and cool those beverages to a stable temperature of 38  
 32 degrees F within 12 hours or less. Daily energy consumption shall be  
 33 measured in accordance with the American national standards  
 34 institute/American society of heating, refrigerating and air-  
 35 conditioning engineers test method 117-2002, except that the back-

1 loading doors of pass-through and roll-through refrigerators and  
 2 freezers must remain closed throughout the test, and except that the  
 3 controls of all appliances must be adjusted to obtain the following  
 4 product temperatures.

Product or compartment type	Integrated average product temperature in degrees Fahrenheit
Refrigerator	38±2
Freezer	0±2

8 ~~((5) Metal halide lamp fixtures designed to be operated with lamps~~  
 9 ~~rated greater than or equal to 150 watts but less than or equal to 500~~  
 10 ~~watts shall not contain a probe start metal halide lamp ballast.~~

11 ~~(6)(a) Single voltage external AC to DC power supplies shall meet~~  
 12 ~~the requirements in the following table:~~

Nameplate output	Minimum Efficiency in Active Mode
<1 Watt	0.49 * Nameplate Output
>or= 1 Watt and <or= 49 Watts	0.09 * Ln(Nameplate Output) + 0.49
>49 Watts	0.84
	Maximum Energy Consumption in No Load Mode
<10 Watts	0.5 Watts
>or= 10 Watts and <or= 250 Watts	0.75 Watts

20 ~~Where Ln(Nameplate Output) Natural Logarithm of the nameplate output expressed in Watts~~  
 21 ~~(b) For the purposes of this section, efficiency of single voltage~~  
 22 ~~external AC to DC power supplies shall be measured in accordance with~~  
 23 ~~the United States environmental protection agency's "Test Method for~~  
 24 ~~Calculating the Energy Efficiency of Single Voltage External AC to DC~~  
 25 ~~and AC to AC Power Supplies," by Ecos Consulting and Power Electronics~~  
 26 ~~Application Center, dated August 11, 2004.~~

27 ~~(7)) (3)(a) The lamp electrical power input of state-regulated~~  
 28 ~~incandescent reflector lamps shall meet the minimum average lamp~~  
 29 ~~efficacy requirements for federally regulated incandescent reflector~~  
 30 ~~lamps contained in 42 U.S.C. Sec. 6295(i)(1)(A)-(B).~~

31 (b) The following types of incandescent lamps are exempt from these  
 32 requirements:

33 (i) Lamps rated at fifty watts or less of the following types: BR  
 34 30, ER 30, BR 40, and ER 40;

1 (ii) Lamps rated at sixty-five watts of the following types: BR  
2 30, BR 40, and ER 40; and

3 (iii) R 20 lamps of forty-five watts or less.

4 ~~((8) Unit heaters must be equipped with intermittent ignition  
5 devices and must have either power venting or an automatic flue  
6 damper.))~~

7 (4)(a) Wine chillers designed and sold for use by an individual  
8 must not exceed the applicable requirements listed in the following  
9 table:

<u>Equipment Type</u>	<u>Maximum Annual Appliance Energy Consumption (kWh)</u>
<u>Wine chillers with manual defrost</u>	<u>13.7V + 267</u>
<u>Wine chillers with automatic defrost</u>	<u>17.4V + 344</u>

15 V = volume in ft<sup>3</sup>.

16 (b) Wine chillers shall be tested in accordance with the code of  
17 federal regulations, section 430.23(a) (2005), with the following  
18 modifications:

19 Standardized temperature as referred to in section 3.2 of appendix A1  
20 shall be 55°F (12.8°C).

21 The calculation of test cycle energy expended (ET) in section 5.2.1.1  
22 of appendix A1 shall be made using the modified formula:

25 
$$ET = (EP \times 1440 \times k) / T$$

27 Where:

29 
$$k = 0.85$$

31 (5)(a) The standby energy consumption of bottle-type water  
32 dispensers, and point-of-use water dispensers, dispensing both hot and  
33 cold water, manufactured on or after January 1, 2010, shall not exceed  
34 1.2 kWh/day.

35 (b) The test method for water dispensers shall be the environmental  
36 protection agency energy star program requirements for bottled water  
37 coolers version 1.1.

38 (6)(a) The standby loss of hot water dispensers and minitank

1 electric water heaters manufactured on or after January 1, 2010, shall  
2 be not greater than 35 watts.

3 (b) This subsection does not apply to any water heater:

4 (i) That is within the scope of 42 U.S.C. Sec. 6292(a)(4) or  
5 6311(1);

6 (ii) That has a rated storage volume of less than 20 gallons; and

7 (iii) For which there is no federal test method applicable to that  
8 type of water heater.

9 (c) The test method for hot water dispensers is as follows:

10 (i) Connect the hot water dispenser to a water supply, a power  
11 supply, and a means of measuring energy use. Fill the hot water  
12 dispenser with water and apply the power supply. Control the ambient  
13 temperature in the laboratory at 77°F ± 7°F throughout the test.

14 (ii) Let the unit operate in standby mode for at least two complete  
15 cycles of thermostat operation, with the thermostat set to 150°F ± 10°F  
16 as described in (c)(iii) of this subsection.

17 (iii) If the thermostat is adjustable, set it to produce water at  
18 150°F ± 10°F, determined by discharging five oz. of water into an  
19 insulated cup immediately after a thermostat cut out, then measuring  
20 its temperature.

21 (iv) If the thermostat is adjustable, and the temperature is not  
22 within the tolerance shown in (c)(ii) of this subsection, readjust the  
23 thermostat and allow it to operate in standby mode for two cycles,  
24 measuring the discharge temperature immediately after the second cut  
25 out, as described in (c)(iii) of this subsection.

26 (v) After the thermostat has been properly adjusted, allow the unit  
27 to operate in standby mode for a minimum of two cycles, then measure  
28 the electricity used (in Wh) during the next twenty-four hours (plus  
29 time for first cut out after twenty-four hours). Begin measuring  
30 electricity usage immediately after a thermostat cut out, and end just  
31 after the first thermostat cut out after twenty-four hours. The total  
32 length of the test will be somewhat longer than twenty-four hours,  
33 depending on the first cut out after twenty-four hours. Divide the  
34 measured electricity used (in Wh) by the time (in hours), to obtain the  
35 standby loss (in watts).

36 (vi) Record the water temperature measured in (c)(iv) of this  
37 subsection and the standby loss calculated in (c)(v) of this  
38 subsection.

1       (d) The test method for minitank electric water heaters is as  
2 follows:

3       (i) Storage tank volume. Determine the storage capacity of the  
4 water heater, in gallons, by subtracting the weight of the empty water  
5 heater from the weight of the water heater when completely filled with  
6 water (with all air eliminated and line pressure applied) and dividing  
7 the resulting net weight by the density of water at the measured  
8 temperature.

9  
10  $V = W_f - W_t \rho$

11  
12 Where:

13  
14 V = the storage capacity in gallons

15 W<sub>f</sub> = the weight of the water heater when full (lb)

16 W<sub>t</sub> = the weight of the empty water heater (lb)

17 ρ = the density of the water (lb/gal)

18       (ii) Test set-up

19       (A) Insulate the water piping, including heat traps, if provided by  
20 the manufacturer, for a length of four feet from the connection to the  
21 appliance with material having a thermal resistance I value of not less  
22 than 4°F x ft<sup>2</sup> x hr/Btu. Ensure that the insulation does not contact  
23 any water heater surface except at the location where the pipe  
24 connections penetrate the appliance jacket.

25       (B) If the manufacturer has not provided a temperature and pressure  
26 relief valve, one shall be installed and insulated.

27       (C) Maintain the temperature of the supply water at 70°F ± 2°F and  
28 the pressure of the water supply between 40 psi and the maximum  
29 pressure specified by the manufacturer. The accuracy of the pressure  
30 measuring devices shall be within ± 1.0 pound per square inch. The  
31 water heater shall be isolated by use of a shut off valve in the supply  
32 line with an expansion tank installed in the supply line downstream of  
33 the shut off valve. There shall be no shut off means between the  
34 expansion tank and the appliance inlet.

35       (D) Before starting testing of the water heater, the setting of the  
36 thermostat shall first be obtained by supplying the water in the system  
37 at 70°F ± 2°F and then noting the maximum mean temperature of the water  
38 after the thermostat shuts off the electric supply to be 142°F ± 8°F.

39       (E) For measuring the energy consumption, instrumentation shall be

1 installed which measures within  $\pm 2$  percent. Voltage shall be within  
2  $\pm 10$  percent of the rated voltage.

3 (F) Three or more temperature sensing means shall be installed  
4 inside the storage tank on the vertical center of each of three or more  
5 non overlapping sections of approximately equal volume from the top to  
6 the bottom of the tank. Each temperature sensing means is to be  
7 located as far as possible from any heat source or other irregularity,  
8 anodic protective device, or water tank or flue wall. The anodic  
9 protective device shall be removed in order to install the temperature  
10 sensing means, and testing shall be carried out with the device  
11 removed. If the temperature sensing means cannot be installed as  
12 specified, placement of the temperature sensing means shall be made at  
13 the discretion of the testing agency so that comparable water  
14 temperature measurements are obtained. A temperature sensing means,  
15 shielded against direct radiation and positioned at the vertical  
16 midpoint of a tank type water heater at a perpendicular distance of  
17 approximately twenty-four inches from the surface of the jacket, shall  
18 be installed in the test room.

19 (G) The ambient air temperature of the test room shall be  
20 maintained at  $75^{\circ}\text{F} \pm 10^{\circ}\text{F}$ . The ambient temperature shall not vary more  
21 than  $\pm 7.0^{\circ}\text{F}$  from the average during the test, temperature readings  
22 being taken at fifteen-minute intervals and averaged at the end of the  
23 test.

24 (iii) Standby loss. Fill the water heater with water. Turn on the  
25 electric power to the water heater. After the first cut out, allow the  
26 water heater to remain in the standby mode until the next cut out. At  
27 this time, record the time, ambient temperature, and begin measuring  
28 the electric consumption. Record the maximum mean tank temperature  
29 that occurs after cut out. Record the mean tank temperature and the  
30 ambient air temperature at the end of the first fifteen-minute interval  
31 and at the end of each subsequent fifteen-minute interval. The  
32 duration of this test shall be until the first cut out that occurs  
33 after twenty-four hours. Immediately after the conclusion of the test,  
34 record the total electrical energy consumption, the final ambient air  
35 temperature, and the time duration of the standby loss test (t) in  
36 hours rounded to the nearest one hundredth of an hour and the maximum  
37 mean tank temperature that occurs after cut out. Calculate the average  
38 of the recorded values of the mean tank temperatures and of the ambient

1 air temperatures taken at the end of each time interval, including the  
2 initial and final values. Determine the difference ( $\Delta T_3$ ) between these  
3 two averages by subtracting the latter from the former, and the  
4 differences ( $\Delta T_4$ ) between the final and initial mean tank temperatures  
5 by subtracting the latter from the former.

6  
7 Determine the standby loss (W) using the formula:

8  
9 
$$W = S \times K \times V (\Delta T_1) / (3412 \text{ Btu/kWh})$$

10  
11 Where:

12  
13  $\Delta T_1 = 70^\circ\text{F}$ , the nominal difference between mean tank temperature and  
14 the average ambient air temperature

15 S = standby loss, hr-1

16 K = 8.25 Btu per gallon  $^\circ\text{F}$ , the nominal specific heat of water

17 V = tank capacity expressed in gallons

18 3412 = conversion factor from kWh to Btu/hr

19 (7) The following standards are established for pool heaters,  
20 residential pool pumps, and portable electric spas:

21 (a) Natural gas pool heaters shall not be equipped with constant  
22 burning pilots.

23 (b) Pool pump motors shall meet the following standards:

24 (i) Pool pump motors manufactured on or after January 1, 2010, may  
25 not be split-phase or capacitor start -- induction run type.

26 (ii) Pool pump motors with a capacity of 1 HP or more which are  
27 manufactured on or after January 1, 2010, shall have the capability of  
28 operating at two or more speeds with a low speed having a rotation rate  
29 that is no more than one-half of the motor's maximum rotation rate.

30 (iii) Pool pump motor controls manufactured on or after January 1,  
31 2010, shall have the capability of operating the pool pump at at least  
32 two speeds. The default circulation speed shall be the lowest speed,  
33 with a high speed override capability being for a temporary period not  
34 to exceed one normal cycle.

35 (c) The standby power of portable electric spas manufactured on or  
36 after January 1, 2010, shall be not greater than  $5(V^{2/3})$  watts where V  
37 = the total volume, in gallons.

38 (d) The test method for portable electric spas is as follows:

39 (i) Minimum continuous testing time shall be seventy-two hours.

40 (ii) The water temperature shall remain at or above the test  
41 temperature of  $102^\circ\text{F}$  for the duration of the test.

1 (iii) The ambient air temperature shall remain at or below the test  
2 temperature of 60°F for the duration of the test.

3 (iv) The standard cover that comes with the unit shall be used  
4 during the test.

5 (v) The test shall start when the water temperature has been at  
6 102°F for at least four hours.

7 (vi) Record the total energy use for the period of test, starting  
8 at the end of the first heating cycle after the four-hour stabilization  
9 period, and finishing at the end of the first heating cycle after  
10 seventy-two hours has elapsed.

11 (vii) The unit shall remain covered and in the default operation  
12 mode during the test. Energy conserving circulation functions, if  
13 present, must not be enabled if not appropriate for continuous, long-  
14 term use.

15 (viii) Data reported shall include: Spa identification (make,  
16 model, S/N, specifications); volume of the unit in gallons; cover R-  
17 value; supply voltage; average relative humidity during test; minimum,  
18 maximum, and average water temperatures during test; minimum, maximum,  
19 and average ambient air temperatures during test; date of test; length  
20 of test (t, in hours); total energy use during the test (P, in Wh); and  
21 standby power (P/t, in watts).

22 (8)(a) The leakage rate of tub spout diverters shall be no greater  
23 than the applicable requirements shown in the following table:

Appliance	Testing Conditions	Maximum Leakage Rate
		Effective January 1, 2009
	When new	0.01 gpm
<u>Tub spout diverters</u>	After 15,000 cycles of diverting	0.05 gpm

24  
25  
26  
27  
28 (b) Showerhead-tub spout diverter combinations shall meet both the  
29 standard for showerheads and the standard for tub spout diverters.

30 (9)(a) The idle energy rate of commercial hot food holding cabinets  
31 manufactured on or after January 1, 2010, shall be no greater than 40  
32 watts per cubic foot of measured interior volume.

33 (b) The idle energy rate of commercial hot food holding cabinets  
34 shall be determined using ANSI/ASTM F2140-01 standard test method for  
35 the performance of hot food holding cabinets (test for idle energy rate

1 dry test). Commercial hot food holding cabinet interior volume shall  
2 be calculated using straight line segments following the gross interior  
3 dimensions of the appliance and using the following equation: Interior  
4 height x interior width x interior depth. Interior volume shall not  
5 account for racks, air plenums, or other interior parts.

6 **Sec. 3.** RCW 19.260.050 and 2006 c 194 s 4 are each amended to read  
7 as follows:

8 (1) No new (~~commercial prerinse spray valve, commercial clothes~~  
9 ~~washer,~~) commercial refrigerator or freezer(~~(,)~~) or state-regulated  
10 incandescent reflector lamp(~~(, or unit heater)~~) manufactured on or  
11 after January 1, 2007, may be sold or offered for sale in the state  
12 unless the efficiency of the new product meets or exceeds the  
13 efficiency standards set forth in RCW 19.260.040. No new automatic  
14 commercial ice cube machine(~~(, single voltage external AC to DC power~~  
15 ~~supply, or metal halide lamp fixtures)~~) manufactured on or after  
16 January 1, 2008, may be sold or offered for sale in the state unless  
17 the efficiency of the new product meets or exceeds the efficiency  
18 standards set forth in RCW 19.260.040.

19 (2) On or after January 1, 2008, no new (~~commercial prerinse spray~~  
20 ~~valve, commercial clothes washer,~~) commercial refrigerator or  
21 freezer(~~(, single voltage external AC to DC power supply,~~) or state-  
22 regulated incandescent reflector lamp(~~(, or unit heater)~~) manufactured  
23 on or after January 1, 2007, may be installed for compensation in the  
24 state unless the efficiency of the new product meets or exceeds the  
25 efficiency standards set forth in RCW 19.260.040. On or after January  
26 1, 2009, no new automatic commercial ice cube machine (~~(or metal halide~~  
27 ~~lamp fixtures)~~) manufactured on or after January 1, 2008, may be  
28 installed for compensation in the state unless the efficiency of the  
29 new product meets or exceeds the efficiency standards set forth in RCW  
30 19.260.040.

31 (3) Standards for (~~metal halide lamp fixtures and~~) state-  
32 regulated incandescent reflector lamps are effective on the dates in  
33 subsections (1) and (2) of this section.

34 (4) The following products, if manufactured on or after January 1,  
35 2010, may not be sold or offered in the state unless the efficiency of  
36 the new product meets or exceeds the efficiency standards set forth in  
37 RCW 19.260.040:

- 1       (a) Wine chillers for use by an individual;  
2       (b) Hot water dispensers and minitank electric water heaters;  
3       (c) Bottle-type water dispensers and point-of-use water dispensers;  
4       (d) Pool heaters, residential pool pumps, and portable electric  
5 spas;  
6       (e) Tub spout diverters; and  
7       (f) Commercial hot food holding cabinets.  
8       (5) The following products, if manufactured on or after January 1,  
9 2010, may not be installed for compensation in the state on or after  
10 January 1, 2011, unless the efficiency of the new product meets or  
11 exceeds the efficiency standards set forth in RCW 19.260.040:  
12       (a) Wine chillers for use by an individual;  
13       (b) Hot water dispensers and minitank electric water heaters;  
14       (c) Bottle-type water dispensers and point-of-use water dispensers;  
15       (d) Pool heaters, residential pool pumps, and portable electric  
16 spas;  
17       (e) Tub spout diverters; and  
18       (f) Commercial hot food holding cabinets.

--- END ---